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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/675,541	09/29/2000	Wan-Chieh Pai	21650.05600	2643

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EXAMINER

HAN, QI

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/675,541

Applicant(s)

PAI, WAN-CHIEH

Examiner

Qi Han

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-16 and 19 is/are rejected.
- 7) ☐ Claim(s) 8-9, 17-18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

1. Claims 4 and 11 are objected to because of the following informalities:

Regarding claim 4, the limitation of “to decay approximately **exponentially with the logarithm of time**” lacks support in the specification. Appropriate correction is required.

Regarding claim 11, see line 6 of the claim, the limitation of “**exponential with the logarithm of time**” lacks support in the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7, 10-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hermansky et al. (US 5,450,522), hereinafter referenced as Hermansky, in view of Hollier et al. (US 5,848,384) hereinafter referenced as Hollier, and further in view of Theile (US 4,972,484) hereinafter referenced as Theile.

As per **claim 1**, Hermansky discloses an auditory model for parameterization of speech (audio) (title), using the technique of the filtering of time trajectories of an auditory-like spectrum derived from the perceptual liner predictive method of speech parameter estimation (abstract), comprising:

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a) providing a filter having a selected transfer function (column 6, lines 49-66, 'the temporal filtering' and 'transfer function'; Fig.3, steps 208-210) ;

b) inputting simultaneous masking signals into the filter (column 6, lines 25-45, 'critical-band masking curves', 'computed critical-band spectrum', which suggests performing simultaneous masking before the temporal filtering'; Fig.3 steps 204-206);

Even though Hermansky suggests that the temporal filtering involves some level of temporal masking (column 6, lines 54-64, 'smoothing out some of the fast frame-to-frame spectral changes', column 7, lines 20-22, 'an engineering approximation to the non-equal sensitivity of human hearing'), Hermansky does not expressly disclose "c) generating approximate replica temporal masking signals at the filter output". However, this feature is well known in the art as evidenced by Hollier who teaches that a temporal masking in that masking values (temporal masking signal) is performed by providing an exponential decay after a significant amplitude value, so that masking values are calculated (interpreted as approximate replica) by using the exponential decay in three following time segments, including the forward masking processing that is replicated to perform backward masking (column 8, lines 37-67). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Hermansky by specifically providing generating temporal masking values (signals), for approximation of temporal making effect, as taught by Hollier, for the purpose of estimating the subjective performance of real system (column 1, lines 17-18).

Further, Hermansky in view of Hollier does not expressly disclose "d) adding the simultaneous masking signals and the replica temporal masking signals to form a composite masking signal". However, this feature is well known in the art as evidenced by Theile et al.

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who teaches a method of transmitting or storing masked sub-band coded audio signals (title), comprising that the available total information (including spectral masking and temporal masking information) flow is given by stage 5.5 (Fig. 3) (column 12, lines 57-58), and that time distribution of quantizing is effected, as is the spectral distribution to the individual sub-bands, on the base of the masking threshold criterion, with a consideration being made in stage 5.5 of Fig. 3, to maintain a minimum mask-to-noise ratio (column 16, lines 50-55), which is broadly interpreted as "form a composite masking signal" as claimed. Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Hermansky in view of Hollier by specifically providing a total information flow for the masking effect, as taught by Theile, for the purpose of data reduction for the system (column 1, line 33).

Hermansky in view of Hollier in view of Theile further discloses "e) using the composite masking signal to establish the masking threshold level, (Hollier: column 9, lines 2-5, 'amplitudes' 'thresholded'; Theile: column 16, lines 50-55, 'to maintain a minimum mask-to-noise ratio').

As per **claim 2** (depending on claim 1), Hermansky in view of Hollier in view of Theile further discloses f) carrying out said code quantization in each of a plurality of frequency domain subbands over a broad audio bandwidth; and g) performing steps a) through e) in each said subband, (Theile: column 4, lines 62-67, 'quantizing of the sub-band signals' (with 24 sub-bands), Fig. 3, 'allocation of resolutions', Fig. 1A-1E, 'trans-coding').

As per **claim 3** (depending on claim 1), Hermansky in view of Hollier in view of Theile further discloses "f) continuously carrying out said code quantization over a plurality of sequential time frames; and g) performing steps a) through e) over a selected number of said

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sequential time frames”, (Theile: column 5, lines 6-23, ‘quantizations of the sub-band signal’ ‘on the bases of the spectral and temporal masking thresholds’; column 8, lines 52-53, ‘three following time segments (frames)’ ; ‘column 7, lines 35-39, ‘the time intervals (block lengths)(also corresponding to sequential time frames) on which the determination of the scale factor is based corresponding to the temporal masking...’).

As per **claim 4** (depending on claim 1), as best understood in view of claim objection (see above), Hermansky in view of Hollier in view of Theile further discloses “said selected transfer function causes said temporal masking signals to decay approximately exponentially with the logarithm of time”, (Theile: column 8, lines 37-49, ‘a temporal masking is performed by providing an exponential decay after a significant amplitude value’).

As per **claim 5** (depending on claim 1), Hermansky in view of Hollier in view of Theile further discloses “said selected transfer function causes said temporal masking signals to decay at a rate which is approximately inversely proportional to the duration of the corresponding simultaneous masking signal”, (Theile: column 8, lines 37-49, ‘the rate of decay of the masking effect depends upon the time of application of the masking sound, the decay time is higher for a longer time of application than for a shorter time’, which corresponds to the claim).

As per **claim 6** (depending on claim 1), Hermansky in view of Hollier in view of Theile further discloses the filter is an infinite impulse response filter, (Hermansky: column 6, line 53 and column 7, lines 4-10, ‘IIR filter’).

As per **claim 7** (depending on claim 6), Hermansky in view of Hollier in view of Theile further discloses the filter is an M order auto regressive and L order moving average filter,

(Hermansky: column 6, lines 58-67, wherein ‘the transfer function’ (see the equation) corresponds to the claimed limitation).

As per **claim 10** (depending on claim 6), Hermansky in view of Hollier in view of Theile further discloses “step g) is carried out in fewer than the total number of subbands in said plurality of subbands”, (Hermansky: column 7, lines 8-9, ‘the same filter need not be used for all frequency channels (subbands)).

As per **claim 11**, as best understood in view of claim objection (see above), it recites method, which corresponds to the combination of claims 1 and 4. The rejection is based on the same reason described for claims 1 and 4, because claim 11 recites same or similar limitation(s) as claims 1 and 4.

As per **claims 12-16 and 19** (depending on claim 11), the rejection is based on the same reason described for claims 2-3, 5-7 and 10, respectively, because claims 12-16 and 19 recite same or similar limitation(s) as claims 2-3, 5-7 and 10, respectively.

Allowable Subject Matter

3. Claims 8-9 and 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner’s statement of reasons for allowance:

Regarding **claims 8 and 9**, it depends on claim 7 and includes all the limitations of its parent claim. In addition, the claim recites the uniquely distinct features of generating approximate replica temporal masking signal by using an infinite impulse response filter that is

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defined as a 2 order auto regressive and 2 order moving average filter (claim 8), and the filer further comprises a specifically selected transfer function with specifically defined the parameters (see claim 9). The prior art of record fail to specifically disclose or fairly suggest doing so.

Regarding **claims 17 and 18**, the reasons for allowance are same as claims 8-9, because claims 17 and 18 recite same or similar limitation(s) as claims 8-9, respectively.

The prior art (Hermansky et al. (US 5,450,522), Hollier et al. (US 5,848,384), and Theile (US 4,972,484)) of record provided numerous teachings of alternative techniques and/or structures for frequency and time masking, filtering and coding for audio signal. However, the features as presented above are not anticipated by, nor made obvious over the prior art of the record.

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Conclusion

4. Any response to this office action should be mailed to:
Commissioner of Patents and Trademarks, P.O. Box 1450, Alexandria, VA22313-1450
or faxed to:
(703)-872-9314
Hand-delivered responses should be brought to:
Crystal Park II, 2121 Crystal Drive, Arlington. VA. Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (703) 305-5631. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. and Friday from 8:00 a.m. to 12:00 a.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (703) 305-6954.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

QH/qh
May 17, 2004


RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER